Claims

1. A mask assembly comprising:

a body having an internal surface, an external surface, and a perimeter surface; and

a forehead support connected to the body, the forehead support having an EEG sensor located thereon.

2. The assembly of claim 1, wherein the perimeter surface includes a padding material having a thermosensitive coating.

3. The assembly of claim 1 wherein the forehead support includes a forehead support bar extending in a generally lateral direction from the forehead support bar.

4. The assembly of claim 3, and wherein an SPO2 sensor is located on the forehead support bar.

5. The assembly of claim 4, wherein the EEG sensor includes a pad comprised of a conductive carbonized rubber material.

6. The assembly of claim 1, and further comprising a strap extending from the mask, and wherein a physiological sensor is located on the strap.

7. The assembly of claim 1, wherein a portion of the conductive padding is adapted to measure EOG.

8. A gas delivery system comprising:

a mask having at least one physiological sensor connected thereto;

a gas delivery device having an adjustable gas delivery setting; and

a processor in communication with the gas delivery device and the sensor, the processor adapted to determine the existence of a sleep disorder and to adjust the gas delivery setting based thereon.

9. The system of claim 8, wherein the sensor is an EMG sensor.

10. The system of claim 8, wherein the sensor is an ECG sensor.

11. The system of claim 10, and further comprising a SPO2 sensor connected to the mask.

12. The system of claim 8, wherein the sensor is an EEG sensor.

13. The system of claim 8, wherein the processor is also adapted to determine patient arousal.

14. A gas delivery system comprising:

a mask having at least one EEG sensor connected thereto;

a gas delivery device having an adjustable gas delivery setting; and

a processor in communication with the gas delivery device and the EEG sensor, the processor adapted to determine arousal and to adjust the gas delivery setting based thereon.

15. The system of claim 14, wherein an SPO2 sensor and an ECG sensor are connected to the mask, and wherein the processor is in communication with both sensors and is adapted to derive a PTT value from an output of each sensor.

16. The system of claim 14, and further comprising a strap extending from the mask and a plurality of EMG sensors located on the mask and strap, the EMG sensors positioned to detect muscle activity related to sleep state.

17. A method of delivering gas comprising:

providing a mask adapted to detect physiological signals and to deliver a gas;

providing a gas delivery device in fluid communication with the mask and having

an adjustable gas output;

determining a sleep state from physiological signals detected by the mask; and

adjusting the output from the gas delivery device based on the sleep state.

18. The method of claim 17, wherein determining a sleep state includes determining arousal.

19. The method of claim 18, wherein determining arousal includes calculating PTT values from an SPO2 and ECG readings.

20. The method of claim 18, wherein determining arousal includes analyzing cortical and subcortical EEG signals.

21. A method of obtaining SPO2 reading from a mask comprising:

attaching a light source and a light sensor on a mask so that the light source and light sensor are positioned to contact a person's forehead;

illuminating the light source;

detecting light from the light source as it deflects from the person's skull; and

converting the detected light into an analog signal.

22. The method of claim 21, and further comprising the additional step of high pass filtering the analog signal.

22. A method of detecting oral or nasal breathing during nasal ventilation, the method comprising:

providing a mask adapted to form a seal between a patient's nose and mouth, the mask having an interior surface and an exterior surface, the mask also having a first thermal sensor on the interior surface and a second thermal sensor located on the exterior surface to be adjacent the patient's mouth;

detecting a temperature change in the first or second thermal sensor.

23. An apparatus comprising:

a mask having a body position sensor attached thereto;

a processor in communication with the sensor and adapted to a determine body position from the body position sensor's output.

24. The apparatus of claim 23, and further comprising movement sensor attached to the mask and in communication with the processor, and wherein the processor is also adapted to determine movement from an output of the movement sensor.

25. A method of detecting a leak in a breathing mask:

providing a mask having a perimeter surface with a plurality of thermally conductive surfaces distributed throughout the perimeter surface; and

detecting a temperature change in any of the plurality of thermally conductive surfaces.

26. A mask assembly comprising:

a body having an internal surface, an external surface, and a perimeter surface; and

a forehead support extending from the body and adapted to contact a forehead surface of a patient during use, the forehead support having a plurality of sensors located thereon for detecting electrophysiological signals of the patient.

27. The mask assembly of claim 26 wherein the forehead support includes a support pad in contact with the forehead surface.

28. The mask assembly of claim 26 further comprising:

a movement sensor for detecting movement of the patient during use.

29. The mask assembly of claim 26 further comprising:

a mask seal leakage detector.

30. A gas delivery system comprising:

a gas mask adapted to fit on a patient;

a gas delivery device having an adjustable gas delivery; and

a processor in communication with the gas delivery device and a cardiac pacemaker, the processor adapted to adjust the gas delivery based on a signal from the cardiac pacemaker.

31. The gas delivery system of claim 30 wherein the processor receives an additional electrophysiological signal from the patient, and said processor determines the existence of a sleep disorder based upon the signals.